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Effectiveness in Disease and Injury Prevention

Safety-Belt Use Among Drivers Involved in Alcohol-Related Fatal Motor-Vehicle Crashes – United States, 1982–1989

Since the early 1980s, safety-belt use by motor-vehicle drivers in the United States has increased substantially from approximately 11% in 1982 to 49% in 1990 (*1*). From 1983 through 1989, the use of safety belts saved an estimated 20,086 lives and prevented approximately 523,100 moderate to critical injuries (*2*). Despite these benefits, a large proportion of drivers continues to drive without using safety belts, including many persons who drive after drinking alcoholic beverages (*3–6*). In addition, drivers who are unrestrained by safety belts are more likely to be involved in crashes (*7*) and to commit traffic violations (*3,7*). This report summarizes data from the National Highway Traffic Safety Administration's (NHTSA) Fatal Accident Reporting System on trends in safety-belt use among drivers involved in alcohol-related fatal crashes in the United States from 1982 through 1989. In addition, a quarterly table (page 414 of this issue) presents data on alcohol involvement in fatal motor-vehicle crashes in the United States for April– Jun 990.

NHTSA defines a fatal traffic crash to be alcohol-r ed if either a driver or nonoccupant (e.g., a pedestrian) had a blood alcohol concentration (BAC) ≥0.01 g/dL in a police-reported traffic crash. NHTSA defines a BAC ≥0.01 g/dL but <0.10 g/dL as a low level of alcohol and a BAC ≥0.10 g/dL (the legal level of intoxication in most states) as indicating intoxication. Because BAC levels are not available for all persons involved in fatal crashes, NHTSA estimates the number of alcohol-related traffic fatalities based on a discriminant analysis of information from all cases for which driver or nonoccupant BAC data are available (*8*). In this report, "drinking driver" refers to drivers with a BAC ≥0.01 g/dL, and "unrestrained" refers to drivers not using safety belts. Data on drivers refer only to drivers involved in fatal crashes.

From 1982 through 1989, safety-belt use increased from 6.3% to 53.6% among nondrinking drivers involved in fatal crashes; in contrast, among drinking drivers

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Safety-Belt Use — Continued

involved in fatal crashes, safety-belt use increased from 2.0% to 19.6% (Table 1). During this same period, the proportion of unrestrained, nondrinking drivers involved in fatal crashes decreased 50%, while the proportion of unrestrained, drinking drivers involved in fatal crashes decreased 18%. For each year from 1982 through 1989, safety-belt use among drinking drivers involved in fatal crashes was less than that of nondrinking drivers.

Because driving after drinking and failure to use a safety belt are risk-taking behaviors, the proportion of unrestrained drivers among nondrinking and drinking drivers involved in fatal crashes was examined before and after 1984, when state legislatures began to enact laws regarding mandatory safety-belt use. From 1982 through 1984, the proportion of unrestrained, nondrinking drivers in fatal crashes decreased 4%, and the proportion of unrestrained, drinking drivers decreased 1%. However, from 1984 through 1989, the proportion of unrestrained, nondrinking drivers in fatal crashes decreased 48%; in comparison, the proportion of drinking drivers who were unrestrained decreased 17%. By 1989, when 33 states had mandatory safety-belt use laws, 80% of drinking drivers in fatal crashes were unrestrained, compared with 46% of nondrinking drivers (Table 1).

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Editorial Note: Although the percentage of unrestrained drivers in both alcohol- and nonalcohol-related fatal crashes decreased from 1982 through 1989, the decreases were greater following passage of mandatory safety-belt use laws. Persons involved in fatal crashes may not be representative of the general driving population; however, data from observational surveys and data reported to CDC's Behavioral Risk Factor

TABLE 1. Estimated number and percentage of drivers involved in fatal crashes, by driver* blood alcohol concentration (BAC) level and safety-belt use — United States, 1982–1989

		Drivers, by BAC† and safety-belt use							
		BAC=0.00				BAC ≥0.01%			
		Restrained		Unrestrained		Restrained		Unrestrained	
Year	No. drivers§	No.	(%)	No.	(%)	No.	(%)	No.	(%)
1982	56,029	1,539	(6.3)	22,990	(93.7)	314	(2.0)	15,415	(98.0)
1983	54,656	1,901	(7.6)	23,147	(92.4)	366	(2.4)	14,785	(97.6)
1984	57,512	2,785	(10.3)	24,389	(89.8)	497	(3.3)	14,534	(96.7)
1985	57,883	6,199	(21.9)	22,116	(78.1)	1,048	(7.3)	13,311	(92.7)
1986	60,335	10,329	(34.0)	20,059	(66.0)	2,005	(12.8)	13,700	(87.2)
1987	61,442	13,907	(42.0)	19,202	(58.0)	2,524	(15.6)	13,699	(84.4)
1988	62,253	16,465	(47.1)	18,502	(52.9)	2,785	(16.5)	14,098	(83.5)
1989	60,435	17,239	(53.6)	14,909	(46.4)	2,685	(19.6)	11,009	(80.4)

*Driver may or may not have been killed.

†BAC distributions are estimates for drivers involved in fatal crashes. Numbers of drivers are rounded to the nearest whole number.

§Numbers represent total number of drivers involved in fatal crashes for a given year. Numbers in columns do not sum to total because of missing data on safety-belt use.

Source: Fatal Accident Reporting System, National Highway Traffic Safety Administration.

Safety-Belt Use — Continued

Surveillance System also indicate an overall increase in the percentage of drivers who use safety belts (*6*). The high proportion of unrestrained drivers in fatal alcohol-related crashes suggests an association between drinking and driving, and other risk-taking behaviors.

The findings in this report suggest that drinking drivers are less likely to use safety belts; however, two considerations affect this interpretation. First, data regarding use of safety belts are not available for approximately 25% of all drivers; however, until 1989, the proportions of both drinking and nondrinking drivers for whom data were missing were consistent (Table 2). Second, in states with mandatory safety-belt use laws, police reports regarding safety-belt use in crashes may be biased (*7*). Previous studies indicate that estimates of safety-belt use based on self-reporting exceed those based on observation (*4,7,9*). Because the data presented here reflect police-reported safety-belt use based on information provided by drivers involved in fatal crashes or by witnesses, the levels of safety-belt use among drivers involved may be over-reported.

Despite the potential limitations, the findings in this report indicate that among drivers involved in fatal crashes, the proportion using safety belts has increased. Factors associated with this increase include enactment of mandatory safety-belt use laws. By March 1991, mandatory use laws had been enacted in 38 states, the District of Columbia, and Puerto Rico.

Increases in safety-belt use were more rapid in the early years following passage of mandatory use laws; however, increases have not been as rapid in recent years (Table 1). From 1984 through 1987, overall safety-belt use increased by approximately 28 percentage points, compared with an increase of 7 percentage points for 1987–1990 (*1*). In addition, in states with primary enforcement laws (i.e., police are authorized to stop and cite a driver solely for nonuse of a safety belt), average

TABLE 2. Estimated numbers and percentages of drivers involved in fatal crashes for whom safety-belt use is unknown, and estimated total numbers of drivers involved in fatal crashes, by driver* blood alcohol concentration (BAC) level — United States, 1982–1989

	Drivers, by BAC†					
	BAC=0.00			BAC ≥0.01%		
		Unknown safety-belt use			Unknown safety-belt use	
Year	Total no.	No.	(%)	Total no.	No.	(%)
1982	34,250	9,721	(28.4)	21,779	6,050	(27.8)
1983	34,146	9,098	(26.6)	20,510	5,359	(26.1)
1984	36,831	9,657	(26.2)	20,681	5,650	(27.3)
1985	38,322	10,007	(26.1)	19,562	5,203	(26.6)
1986	39,634	9,246	(23.3)	20,701	4,996	(24.1)
1987	41,050	7,941	(19.3)	20,392	4,169	(20.4)
1988	41,812	6,845	(16.4)	20,441	3,558	(17.4)
1989	41,238	9,090	(22.0)	19,197	5,503	(28.7)

*Driver may or may not have been killed.
†BAC distributions are estimates for drivers involved in fatal crashes. Numbers of drivers are rounded to the nearest whole number.
Source: Fatal Accident Reporting System, National Highway Traffic Safety Administration.

Safety-Belt Use — Continued

safety-belt use rates are higher than those in states with secondary enforcement laws (i.e., police must observe a different violation before they can issue a citation for nonuse of safety belts) (*10*).

To increase safety-belt use and meet a Presidential goal of 70% safety-belt use among all motorists by 1992 (*11*), NHTSA is conducting a national campaign with three major components: 1) increased public information about the benefits of using safety belts and the importance of related law enforcement efforts; 2) increased enforcement of state safety-belt use and child-passenger safety laws, particularly at the local level; and 3) establishment of a national coalition of corporations and organizations in the private sector that supports increased use of safety belts and enforcement of laws regarding use of belts. This campaign is intended to increase public information and enforcement efforts in all states with mandatory use laws, particularly during the summer months and holidays (e.g., Memorial Day, Independence Day, and Labor Day).

For the Independence Day holiday, safety-belt and child safety-seat laws will be intensively enforced from June 30 through July 13. NHTSA will use its 19-City Index of Occupant Protection Trends as one method to assess this and other aspects of the national campaign. In addition, local jurisdictions are encouraged to conduct assessments of this enforcement campaign. Information on NHTSA's "National 70% × '92 Safety Belt Program" is available from Dr. James Nichols, Director, Office of Occupant Protection (NTS-10), NHTSA, 400 Seventh Street, S.W., Washington, DC 20590; telephone (202) 366-9294.

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Current Trends

Eosinophilia-Myalgia Syndrome: Follow-up Survey of Patients — New York, 1990–1991

As of December 1, 1990, 151 cases of eosinophilia-myalgia syndrome (EMS)* had been reported to the New York State Department of Health (NYSDOH); 10 of these patients died. Of the 151 case-patients, 149 were known to have used supplemental L-tryptophan (LT) before onset of illness. Because anecdotal reports indicated that some patients in New York had changes in mental status and other symptoms not previously described in association with EMS, the NYSDOH conducted a survey from December 1990 through March 1991 to determine the prevalence of self-reported symptoms in patients with EMS.

A detailed questionnaire was sent by the NYSDOH to all living patients, asking them to report on the presence of 47 specific symptoms at any time during their illness and at the time of the survey. For each symptom, severity was reported as minimal, moderate, or extreme.

Of the 139 living case-patients who had used LT before onset of EMS, 91 (65%) completed the questionnaire a median of 16 months after onset of illness (range: 11–40 months). The median age of respondents was 51 years (range: 32–84 years); 78% were women. Thirty-seven (41%) had been hospitalized at least once following onset of symptoms. Patients who completed and who did not complete the questionnaire were similar in age, sex, and peak eosinophil count.

Patients reported symptoms involving multiple organ systems during their illness (Table 1). At least 75% of patients reported musculoskeletal, neurologic, and dermatologic symptoms. Specific cognitive problems at any time during illness included difficulty concentrating (63%), difficulty remembering words or names of persons (52%), difficulty thinking logically (52%), difficulty conversing (43%), and impairment of short-term memory (42%). Of the 74 patients who reported depression and/or anxiety as an EMS symptom, pre-EMS medical and psychiatric history was available for 54. Of these patients, 32 (59%) denied psychiatric problems before developing EMS.

At follow-up, 64% of patients reported having moderately or extremely severe EMS symptoms. The most commonly reported persistent symptoms included fatigue (64%), muscle weakness (60%), muscle cramping (57%), myalgia (55%), arthralgia (48%), anxiety (46%), depression (41%), tight skin (40%), and difficulty concentrating (40%) (Table 1). Seventy-five (82%) patients reported that symptoms had become less severe since peak illness; nine (10%) patients reported that they were symptom-free.

One case-patient who did not participate in the survey had undergone a neuropsychologic evaluation in November 1985 before onset of EMS and again in September 1990 while still ill. This evaluation indicated a 29% decrease in intelligence

*Cases met a modified surveillance case definition of eosinophil count ≥1000 cells/mm^3, generalized myalgia (but not necessarily severe enough to affect the patient's ability to pursue usual daily activities, as used in national surveillance conducted by CDC [*1*]), and absence of contributing infection or neoplasm.

Eosinophilia-Myalgia Syndrome — Continued

quotient (IQ) (as measured by the Wechsler adult intelligence scale) thought to be secondary to EMS. Other potential causes for the decrease have not been identified.

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Editorial Note: As of June 1, 1991, state health departments had reported 1543 EMS cases to CDC. The demographic characteristics of patients from New York, who represent 10% of the U.S. total, are similar to those reported from elsewhere in the United States (*1,2*).

EMS is a chronic illness with multiple organ system manifestations. Previous reports have detailed many of the clinical features described in the survey in New York (*3–5*). However, the NYSDOH study identified a high prevalence of symptoms that have not been previously described as common features (e.g., cognitive, psychiatric, visual, gastrointestinal, and menstrual symptoms), as well as persistent symptomatic illness in most EMS patients.

There are at least three potential explanations for the high prevalence of cognitive and psychiatric symptoms reported by patients with EMS in New York. First, these symptoms may reflect the adjustment made by EMS patients to living with a chronic disease with an unknown course and no proven treatments. Second, these symptoms

TABLE 1. Prevalence* of self-reported symptoms caused by eosinophilia-myalgia syndrome in 91 case-patients — New York, 1988–1990

Symptom	Ever present No.	Ever present (%)	At follow-up No.	At follow-up (%)	Symptom	Ever present No.	Ever present (%)	At follow-up No.	At follow-up (%)
Musculoskeletal					**Psychiatric**				
Myalgia	91	(100)	50	(55)	Anxiety	68	(75)	42	(46)
Cramping	79	(87)	52	(57)	Depression	64	(70)	37	(41)
Arthralgia	72	(79)	44	(48)					
Neurologic					**Other**				
Weakness	81	(89)	55	(60)	Fatigue	86	(95)	58	(64)
Numbness	70	(77)	33	(36)	Difficulty walking	68	(75)	35	(38)
Incoordination	49	(54)	23	(25)	Dyspnea	64	(70)	33	(36)
Dermatologic					Anorexia	51	(56)	15	(16)
Rash	70	(77)	25	(27)	Headaches	43	(47)	29	(32)
Edema	65	(71)	24	(26)	Dysphagia	41	(45)	17	(19)
Tight skin	64	(70)	36	(40)	Abdominal pain	37	(41)	25	(27)
Alopecia	64	(70)	17	(19)	Vision changes	37	(41)	25	(27)
Cognitive dysfunction					Diarrhea	32	(35)	17	(19)
Concentration	57	(63)	36	(40)	Abnormal heartbeat	31	(34)	15	(16)
Word finding	47	(52)	35	(38)	Oral ulcers	24	(26)	7	(8)
Logical thought	47	(52)	28	(31)	Menstrual changes†	10	(33)	4	(13)
Conversation	39	(43)	19	(21)					
Short term memory	38	(42)	21	(23)					

*At any time during illness and at time of follow-up. Symptoms at time of follow-up (December 1990–March 1991) are those described as moderately or extremely severe.
†Women <50 years of age (n=30).

Eosinophilia-Myalgia Syndrome — Continued

may be a primary manifestation of inflammatory central nervous system effects, similar to those observed in peripheral nerves and other organ systems (*6–8*). Third, because many of these manifestations are subtle, they may be obscured by the severe pain and disability that characterize EMS, thereby resulting in delayed clinical recognition.

The high prevalence of cognitive and other symptoms reported by patients with EMS in New York requires further clinical and epidemiologic evaluation. The prevalence of symptoms described here is based on self-reports and not on objective evaluations; subsequent evaluations of patients with EMS might include neuropsychologic tests.

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Topics in Minority Health

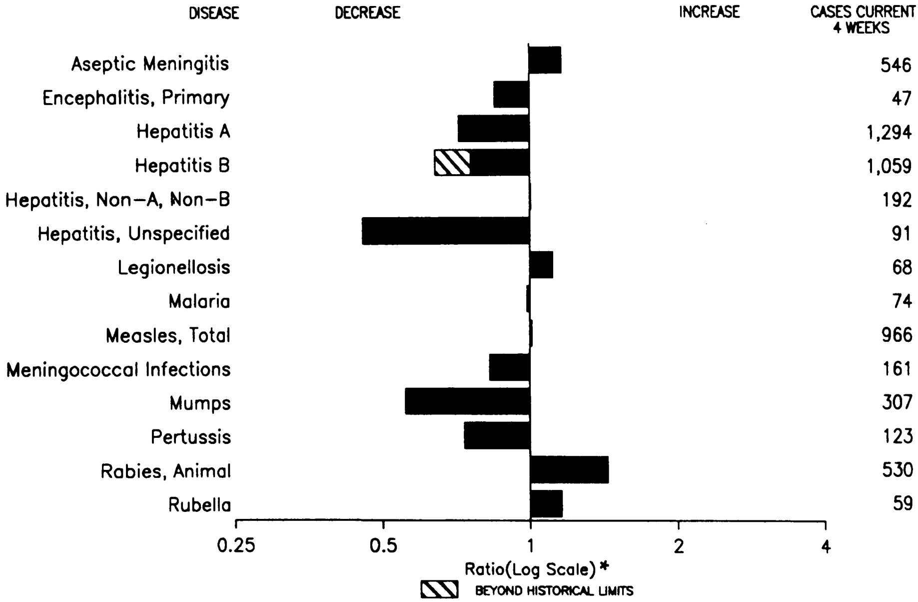
Ethnic Variation and Maternal Risk Characteristics Among Blacks — Massachusetts, 1987 and 1988

Blacks are the largest minority group in the United States. For black women the prevalence of risk characteristics associated with adverse birth outcomes is higher than it is for women of other races (*1,2*). Although risk characteristics for black mothers vary by place of ancestry/ethnicity, the relation between these characteristics and ethnicity among black mothers is not well defined (*3*). This report describes an assessment of the relation between risk characteristics and ethnicity among black women who resided and gave birth in Massachusetts during 1987 and 1988.

To assess this relation, the Massachusetts Department of Public Health (MDPH) used birth certificates for infants of women who were residents of Massachusetts and delivered during 1987 and 1988. The parent questionnaire contains questions on both race and ancestry/ethnicity. A total of 12,066 mothers identified their race as black. Based on MDPH classifications, these women further self-identified their ancestry/ethnicity into one of six mutually exclusive groups: American (7473 [61.9%]), Haitian

(Continued on page 409)

FIGURE I. Notifiable disease reports, comparison of 4-week totals ending June 15, 1991, with historical data — United States



*Ratio of current 4-week total to mean of 15 4-week totals (from previous, comparable, and subsequent 4-week periods for the past 5 years). The point where the hatched area begins is based on the mean and two standard deviations of these 4-week totals.

TABLE I. Summary — cases of specified notifiable diseases, United States, cumulative, week ending June 15, 1991 (24th Week)

	Cum. 1991		Cum. 1991
AIDS	19,128	Measles: imported	89
Anthrax	-	indigenous	6,235
Botulism: Foodborne	9	Plague	-
Infant	22	Poliomyelitis, Paralytic*	-
Other	4	Psittacosis	45
Brucellosis	25	Rabies, human	-
Cholera	14	Syphilis, primary & secondary	19,414
Congenital rubella syndrome	11	Syphilis, congenital, age < 1 year	12
Diphtheria	1	Tetanus	11
Encephalitis, post-infectious	34	Toxic shock syndrome	146
Gonorrhea	260,422	Trichinosis	9
Haemophilus influenzae (invasive disease)	1,632	Tuberculosis	9,618
Hansen Disease	62	Tularemia	43
Leptospirosis	33	Typhoid fever	134
Lyme Disease	2,332	Typhus fever, tickborne (RMSF)	109

*No cases of suspected poliomyelitis have been reported in 1991; none of the 6 suspected cases in 1990 have been confirmed to date. Five of 13 suspected cases in 1989 were confirmed and all were vaccine associated.

TABLE II. Cases of selected notifiable diseases, United States, weeks ending June 15, 1991, and June 16, 1990 (24th Week)

Reporting Area	AIDS	Aseptic Menin-gitis	Encephalitis		Gonorrhea		Hepatitis (Viral), by type				Legionel-losis	Lyme Disease
			Primary	Post-in-fectious			A	B	NA,NB	Unspeci-fied		
	Cum. 1991	Cum. 1991	Cum. 1991	Cum. 1991	Cum. 1991	Cum. 1990	Cum. 1991	Cum. 1991	Cum. 1991	Cum. 1991	Cum. 1991	Cum. 1991
UNITED STATES	19,128	2,541	282	34	260,422	311,379	11,398	7,542	1,331	637	515	2,332
NEW ENGLAND	897	142	13	1	6,519	8,209	274	389	48	23	38	89
Maine	31	7	3	-	66	104	12	14	2	-	-	-
N.H.	21	9	-	-	154	93	19	13	4	-	2	6
Vt.	9	47	1	-	19	28	14	4	4	-	1	1
Mass.	540	42	7	1	2,660	3,184	137	295	27	21	33	44
R.I.	37	30	-	-	521	483	51	13	9	2	2	31
Conn.	259	7	2	-	3,099	4,317	41	50	2	-	-	7
MID. ATLANTIC	5,165	287	21	10	31,437	44,040	990	672	133	13	148	1,696
Upstate N.Y.	688	135	9	6	5,649	6,287	467	273	80	7	44	1,157
N.Y. City	2,811	53	-	-	11,561	18,958	230	70	4	-	16	-
N.J.	1,113	-	-	-	5,096	7,345	140	164	27	-	20	279
Pa.	553	99	12	4	9,131	11,450	153	165	22	6	68	260
E.N. CENTRAL	1,255	444	81	6	48,602	58,264	1,336	905	198	28	101	94
Ohio	244	129	24	2	14,865	17,655	189	207	106	11	52	53
Ind.	110	53	11	1	5,015	4,940	199	115	1	1	10	5
Ill.	582	83	20	3	14,924	18,008	539	118	22	1	4	-
Mich.	219	166	23	-	11,109	13,750	171	296	60	15	25	36
Wis.	100	13	3	-	2,689	3,911	238	169	9	-	10	-
W.N. CENTRAL	520	170	11	3	12,965	16,158	1,197	343	150	12	26	86
Minn.	108	30	5	-	1,301	2,043	168	35	10	2	4	6
Iowa	40	36	-	2	899	1,206	31	21	6	3	6	6
Mo.	292	70	4	1	7,913	9,482	312	235	130	4	10	72
N. Dak.	4	1	-	-	23	64	25	3	2	1	-	-
S. Dak.	1	4	2	-	156	104	468	2	-	-	3	-
Nebr.	32	10	-	-	875	810	151	20	1	-	3	-
Kans.	43	19	-	-	1,798	2,449	42	27	1	2	-	2
S. ATLANTIC	4,418	607	53	10	77,987	87,669	808	1,607	196	134	84	131
Del.	35	8	1	-	1,083	1,420	6	23	3	3	2	16
Md.	442	56	9	-	7,855	9,147	154	216	35	14	16	58
D.C.	269	18	-	-	4,587	5,660	46	63	1	1	-	-
Va.	354	91	14	1	7,838	8,114	88	100	11	91	7	26
W. Va.	25	3	1	-	538	615	10	31	1	6	-	5
N.C.	220	68	18	-	14,674	14,678	87	265	81	-	11	14
S.C.	163	15	-	-	5,616	7,025	24	340	16	3	12	1
Ga.	595	60	6	1	19,764	19,546	87	224	19	-	9	6
Fla.	2,315	288	4	8	16,032	21,464	306	345	29	16	27	5
E.S. CENTRAL	476	154	16	-	23,952	25,127	110	640	165	3	25	55
Ky.	78	39	3	-	2,585	3,003	16	80	5	2	11	20
Tenn.	148	26	9	-	9,166	7,702	68	484	150	-	7	26
Ala.	156	67	4	-	6,067	8,279	25	71	9	1	7	9
Miss.	94	22	-	-	6,134	6,143	1	5	1	-	-	-
W.S. CENTRAL	1,940	269	29	1	30,336	33,326	1,607	919	45	101	19	33
Ark.	94	30	3	-	3,337	4,055	157	53	1	3	4	10
La.	321	37	7	-	7,404	6,225	72	141	4	4	5	-
Okla.	91	1	3	-	2,998	2,882	157	110	19	8	4	21
Tex.	1,434	201	16	1	16,597	20,164	1,221	615	21	86	6	2
MOUNTAIN	501	78	10	1	5,329	6,611	1,933	466	77	92	40	5
Mont.	14	2	-	-	51	83	55	36	3	5	1	-
Idaho	9	-	-	-	70	55	44	34	-	-	3	-
Wyo.	6	-	-	-	49	88	75	5	-	-	-	3
Colo.	192	28	2	1	1,428	1,790	263	70	28	15	7	-
N. Mex.	47	9	-	-	521	573	543	101	7	26	1	-
Ariz.	90	20	8	-	2,026	2,539	637	95	12	38	15	-
Utah	48	8	-	-	154	193	134	24	11	8	4	-
Nev.	95	11	-	-	1,030	1,290	182	101	16	-	9	2
PACIFIC	3,956	390	48	2	23,295	31,975	3,143	1,601	319	231	34	143
Wash.	232	-	5	-	1,979	2,962	291	231	77	12	1	-
Oreg.	94	-	-	-	924	1,186	184	155	61	6	1	-
Calif.	3,542	352	41	2	19,725	26,970	2,576	1,174	167	212	30	143
Alaska	9	13	2	-	363	551	76	17	12	1	-	-
Hawaii	79	25	-	-	304	306	16	24	2	-	2	-
Guam	1	-	-	-	-	119	-	-	-	-	-	-
P.R.	853	129	-	1	308	425	51	194	63	25	-	-
V.I.	4	-	-	-	249	207	-	4	-	-	-	-
Amer. Samoa	-	-	-	-	-	48	-	-	-	-	-	-
C.N.M.I.	-	-	-	-	-	96	-	-	-	-	-	-

N: Not notifiable U: Unavailable C.N.M.I.: Commonwealth of the Northern Mariana Islands

TABLE II. (Cont'd.) Cases of selected notifiable diseases, United States, weeks ending June 15, 1991, and June 16, 1990 (24th Week)

Reporting Area	Malaria	Measles (Rubeola)					Menin-gococcal Infections	Mumps		Pertussis			Rubella		
		Indigenous		Imported*		Total									
	Cum. 1991	1991	Cum. 1991	1991	Cum. 1991	Cum. 1990	Cum. 1991	1991	Cum. 1991	1991	Cum. 1991	Cum. 1990	1991	Cum. 1991	Cum. 1990
UNITED STATES	452	317	6,235	-	89	12,252	1,135	51	2,363	29	932	1,439	7	876	545
NEW ENGLAND	29	-	34	-	10	223	79	-	20	3	165	157	-	2	5
Maine	1	-	-	-	-	27	6	-	-	-	42	5	-	-	-
N.H.	2	-	-	-	-	8	7	-	3	-	12	10	-	1	1
Vt.	1	-	5	-	-	1	10	-	2	-	3	6	-	-	-
Mass.	16	-	9	-	8	17	43	-	-	3	97	126	-	1	-
R.I.	5	-	2	-	-	30	-	-	3	-	-	-	-	-	1
Conn.	4	-	18	-	2	140	13	-	12	-	11	10	-	-	3
MID. ATLANTIC	67	50	3,220	-	2	875	116	-	179	-	85	300	-	456	2
Upstate N.Y.	16	-	18	-	-	263	61	-	70	-	58	238	-	437	1
N.Y. City	22	50	1,375	-	-	140	7	-	-	-	-	-	-	-	-
N.J.	23	-	353	-	1	149	23	-	49	-	1	17	-	-	-
Pa.	6	-	1,474	-	1	323	25	-	60	-	26	45	-	19	1
E.N. CENTRAL	39	-	65	-	6	2,988	165	5	221	3	159	353	-	162	28
Ohio	9	-	-	-	1	210	59	2	51	1	66	67	-	147	-
Ind.	2	-	-	-	1	368	8	-	6	-	37	54	-	1	-
Ill.	14	-	24	-	-	1,227	50	-	81	-	23	123	-	3	17
Mich.	12	-	39	-	-	436	37	3	71	2	23	35	-	11	9
Wis.	2	-	2	-	4	747	11	-	12	-	10	74	-	-	2
W.N. CENTRAL	17	-	24	-	2	588	65	2	65	1	58	47	-	15	6
Minn.	6	-	6	-	2	160	13	-	6	-	18	7	-	6	1
Iowa	3	-	15	-	-	24	7	-	14	-	6	6	-	5	4
Mo.	4	-	-	-	-	74	24	1	20	-	21	28	-	4	-
N. Dak.	1	-	-	-	-	-	1	-	-	-	1	1	-	-	1
S. Dak.	-	-	-	-	-	23	2	-	-	-	1	1	-	-	-
Nebr.	-	-	-	-	-	102	4	-	4	1	5	1	-	-	-
Kans.	3	-	3	-	-	205	14	1	21	-	6	3	-	-	-
S. ATLANTIC	85	1	392	-	15	706	210	16	866	3	72	131	-	10	12
Del.	1	-	21	-	-	11	1	-	6	-	-	3	-	-	-
Md.	26	1	163	-	-	122	23	5	171	1	14	34	-	6	1
D.C.	4	-	-	-	-	16	6	-	20	-	-	14	-	1	1
Va.	14	-	19	-	3	67	21	-	34	-	11	12	-	-	-
W. Va.	1	-	-	-	-	6	10	-	15	-	6	9	-	-	-
N.C.	3	-	29	-	2	19	43	5	158	2	14	29	-	-	-
S.C.	6	-	12	-	-	4	23	3	297	-	-	5	-	-	-
Ga.	11	-	10	-	4	31	41	-	19	-	16	13	-	-	-
Fla.	19	-	138	-	6	430	42	3	146	-	11	12	-	3	10
E.S. CENTRAL	8	1	6	-	-	90	80	-	139	-	28	65	-	83	1
Ky.	2	-	-	-	-	16	29	-	-	-	-	-	-	-	-
Tenn.	3	1	6	-	-	32	23	-	114	-	14	28	-	83	1
Ala.	3	-	-	-	-	16	27	-	7	-	14	32	-	-	-
Miss.	-	-	-	-	-	26	1	-	18	-	-	5	-	-	-
W.S. CENTRAL	23	-	26	-	12	2,396	80	8	262	-	21	27	-	1	1
Ark.	3	-	-	-	5	40	14	1	37	-	2	2	-	1	1
La.	4	-	-	-	-	10	21	3	18	-	8	7	-	-	-
Okla.	1	-	-	-	-	143	9	-	6	-	11	18	-	-	-
Tex.	15	-	26	-	7	2,203	36	4	201	-	-	-	-	-	-
MOUNTAIN	17	111	647	-	15	589	48	10	220	1	122	144	-	4	85
Mont.	1	-	-	-	-	1	6	-	-	-	-	23	-	-	13
Idaho	1	58	213	-	2	21	7	-	6	1	20	25	-	2	45
Wyo.	-	-	-	-	-	11	1	-	3	-	3	-	-	-	-
Colo.	5	-	1	-	4	83	10	9	79	-	61	53	-	-	3
N. Mex.	3	1	108	-	5	90	6	N	N	-	15	7	-	-	-
Ariz.	5	52	274	-	-	185	13	1	110	-	8	26	-	-	22
Utah	1	-	35	-	4	44	-	-	12	-	13	6	-	-	1
Nev.	1	-	16	-	-	154	5	-	10	-	2	4	-	2	1
PACIFIC	167	154	1,821	-	27	3,797	292	10	391	18	222	215	7	143	405
Wash.	13	-	1	-	3	226	37	3	86	7	60	55	-	-	-
Oreg.	4	-	28	-	12	180	37	N	N	-	31	18	-	1	2
Calif.	146	154	1,790	-	9	3,304	211	7	286	11	99	123	7	140	395
Alaska	-	-	-	-	1	80	6	-	7	-	5	-	-	-	-
Hawaii	4	-	2	-	2	7	1	-	12	-	27	19	-	2	8
Guam	-	U	-	U	-	1	-	U	-	U	-	-	U	-	-
P.R.	1	4	66	-	1	914	15	-	8	-	14	5	-	1	-
V.I.	-	-	-	-	-	17	-	-	5	-	-	-	-	-	-
Amer. Samoa	-	U	-	U	-	57	-	U	-	U	-	-	U	-	-
C.N.M.I.	-	U	-	U	-	-	-	U	-	U	-	-	U	-	-

*For measles only, imported cases includes both out-of-state and international importations.

N: Not notifiable U: Unavailable †International §Out-of-state

TABLE II. (Cont'd.) Cases of selected notifiable diseases, United States, weeks ending June 15, 1991, and June 16, 1990 (24th Week)

Reporting Area	Syphilis (Primary & Secondary)		Toxic-shock Syndrome	Tuberculosis		Tula-remia	Typhoid Fever	Typhus Fever (Tick-borne) (RMSF)	Rabies, Animal
	Cum. 1991	Cum. 1990	Cum. 1991	Cum. 1991	Cum. 1990	Cum. 1991	Cum. 1991	Cum. 1991	Cum. 1991
UNITED STATES	19,414	22,569	146	9,618	9,989	43	134	109	2,678
NEW ENGLAND	525	856	7	254	229	-	12	4	12
Maine	-	5	3	9	-	-	1	-	-
N.H.	12	39	1	-	3	-	-	-	1
Vt.	1	1	-	3	7	-	-	-	-
Mass.	253	323	3	135	123	-	10	3	-
R.I.	22	6	-	27	31	-	-	-	-
Conn.	237	482	-	80	65	-	1	1	11
MID. ATLANTIC	3,342	4,982	25	2,236	2,383	-	25	-	860
Upstate N.Y.	103	375	11	146	216	-	6	-	306
N.Y. City	1,598	2,172	1	1,377	1,408	-	11	-	-
N.J.	693	798	-	399	411	-	6	-	379
Pa.	948	1,637	13	314	348	-	2	-	175
E.N. CENTRAL	2,181	1,431	26	988	912	2	13	7	46
Ohio	287	236	16	135	142	-	2	6	6
Ind.	60	23	-	68	75	-	-	1	2
Ill.	1,073	520	4	534	464	-	3	-	10
Mich.	548	463	6	207	194	2	7	-	7
Wis.	213	189	-	44	37	-	1	-	21
W.N. CENTRAL	325	211	29	239	248	12	2	5	398
Minn.	38	46	7	43	46	-	2	-	147
Iowa	28	29	6	32	31	-	-	-	79
Mo.	216	102	7	111	114	12	-	3	6
N. Dak.	-	1	-	2	10	-	-	-	40
S. Dak.	1	1	1	18	6	-	-	-	97
Nebr.	7	6	1	8	14	-	-	-	8
Kans.	35	26	7	25	27	-	-	2	21
S. ATLANTIC	5,808	7,211	13	1,769	1,844	4	25	42	651
Del.	72	90	1	15	24	-	-	-	71
Md.	483	543	-	163	149	-	6	4	241
D.C.	373	431	-	95	71	-	1	-	5
Va.	490	405	3	166	157	-	4	1	134
W. Va.	15	7	-	38	35	-	1	1	29
N.C.	868	841	7	216	219	1	-	20	-
S.C.	694	430	-	183	229	1	-	9	51
Ga.	1,409	1,783	-	324	288	1	4	7	103
Fla.	1,404	2,681	2	569	672	1	9	-	17
E.S. CENTRAL	2,151	1,841	7	712	766	5	1	17	80
Ky.	35	33	4	144	188	1	1	5	21
Tenn.	777	680	3	224	203	4	-	7	18
Ala.	753	615	-	188	239	-	-	5	41
Miss.	586	513	-	156	136	-	-	-	-
W.S. CENTRAL	3,521	3,610	4	1,083	1,221	15	5	32	355
Ark.	289	248	2	96	119	10	-	4	18
La.	1,142	1,109	-	68	166	-	1	-	4
Okla.	82	107	2	70	92	5	-	28	101
Tex.	2,008	2,146	-	849	844	-	4	-	232
MOUNTAIN	253	413	17	239	205	4	5	1	79
Mont.	2	-	-	-	10	3	-	1	14
Idaho	3	6	-	3	5	-	-	-	1
Wyo.	3	1	-	2	3	1	-	-	48
Colo.	40	28	2	6	6	-	1	-	-
N. Mex.	14	20	5	29	40	-	-	-	1
Ariz.	171	289	4	137	104	-	3	-	13
Utah	4	4	6	25	12	-	-	-	-
Nev.	16	65	-	37	25	-	1	-	2
PACIFIC	1,308	2,014	18	2,098	2,181	1	46	1	197
Wash.	76	223	1	135	124	1	-	-	1
Oreg.	36	66	-	50	59	-	2	1	1
Calif.	1,189	1,704	17	1,796	1,880	-	43	-	191
Alaska	3	7	-	27	23	-	-	-	3
Hawaii	4	14	-	90	95	-	1	-	1
Guam	-	1	-	-	22	-	-	-	-
P.R.	223	175	-	71	51	-	5	-	19
V.I.	61	1	-	1	4	-	-	-	-
Amer. Samoa	-	-	-	-	11	-	-	-	-
C.N.M.I.	-	1	-	-	23	-	-	-	-

U: Unavailable

TABLE III. Deaths in 121 U.S. cities,* week ending June 15, 1991 (24th Week)

Reporting Area	All Causes, By Age (Years)						P&I**
	All Ages	≥65	45-64	25-44	1-24	<1	Total
NEW ENGLAND	591	401	99	58	15	18	33
Boston, Mass.	184	110	37	25	5	7	15
Bridgeport, Conn.	62	38	15	7	2	-	1
Cambridge, Mass.	15	11	2	1	1	-	1
Fall River, Mass.	23	17	5	-	1	-	1
Hartford, Conn.	48	32	8	5	2	1	-
Lowell, Mass.	16	12	2	2	-	-	1
Lynn, Mass.	12	8	4	-	-	-	2
New Bedford, Mass.	24	16	4	4	-	-	-
New Haven, Conn.	44	29	6	5	1	3	2
Providence, R.I.	28	24	4	-	-	-	1
Somerville, Mass.	7	5	1	1	-	-	-
Springfield, Mass.	48	40	-	4	3	1	1
Waterbury, Conn.	23	19	2	2	-	-	-
Worcester, Mass.	57	40	9	2	-	6	8
MID. ATLANTIC	2,312	1,448	443	290	66	63	131
Albany, N.Y.	39	29	4	3	1	2	-
Allentown, Pa.	22	16	3	3	-	-	-
Buffalo, N.Y.	100	60	30	6	1	3	2
Camden, N.J.	38	21	7	3	3	4	1
Elizabeth, N.J.	26	17	5	2	2	-	5
Erie, Pa.†	42	31	6	4	1	-	1
Jersey City, N.J.	60	33	13	7	3	2	-
New York City, N.Y.	1,207	740	220	192	33	22	57
Newark, N.J.	45	23	8	10	2	2	4
Paterson, N.J.	20	11	4	4	-	1	3
Philadelphia, Pa.	276	162	60	25	12	17	22
Pittsburgh, Pa.†	58	31	22	3	-	2	5
Reading, Pa.	44	30	6	7	1	-	7
Rochester, N.Y.	129	90	29	6	2	2	11
Schenectady, N.Y.	26	24	1	-	1	-	-
Scranton, Pa.†	30	21	3	4	1	1	2
Syracuse, N.Y.	66	44	12	5	1	4	3
Trenton, N.J.	40	30	5	4	1	-	4
Utica, N.Y.	17	16	1	-	-	-	2
Yonkers, N.Y.	27	19	4	2	1	1	2
E.N. CENTRAL	2,162	1,270	456	254	112	70	130
Akron, Ohio	62	52	5	2	1	2	6
Canton, Ohio	38	29	6	-	2	1	3
Chicago, Ill.	473	174	110	111	65	13	21
Cincinnati, Ohio	162	99	38	10	8	7	12
Cleveland, Ohio	123	76	25	12	5	5	4
Columbus, Ohio	170	102	46	17	4	1	11
Dayton, Ohio	106	75	20	8	1	2	10
Detroit, Mich.	265	156	57	35	9	8	6
Evansville, Ind.	27	19	6	1	1	-	3
Fort Wayne, Ind.	47	31	9	5	1	1	3
Gary, Ind.	21	11	4	3	1	2	-
Grand Rapids, Mich.	69	47	13	4	4	1	6
Indianapolis, Ind.	165	104	35	15	-	11	9
Madison, Wis.	47	30	9	4	2	2	2
Milwaukee, Wis.	125	90	24	4	-	7	10
Peoria, Ill.	70	45	17	5	2	1	7
Rockford, Ill.	45	31	7	4	2	1	6
South Bend, Ind.	54	42	5	3	2	2	6
Toledo, Ohio	93	57	20	11	2	3	5
Youngstown, Ohio§	U	U	U	U	U	U	U
W.N. CENTRAL	815	593	131	53	21	17	39
Des Moines, Iowa	78	59	8	6	3	2	3
Duluth, Minn.	36	25	8	2	1	-	-
Kansas City, Kans.	30	23	3	4	-	-	1
Kansas City, Mo.	121	86	24	7	4	-	2
Lincoln, Nebr.	31	23	6	1	1	-	-
Minneapolis, Minn.	228	161	39	16	5	7	24
Omaha, Nebr.	89	69	14	2	2	2	2
St. Louis, Mo.	111	85	13	8	1	4	3
St. Paul, Minn.	46	28	10	5	2	1	3
S. ATLANTIC	1,281	766	259	162	47	46	51
Atlanta, Ga.	203	119	45	27	6	6	10
Baltimore, Md.	203	120	38	29	7	9	13
Charlotte, N.C.	120	74	23	10	7	6	1
Jacksonville, Fla.	122	82	26	12	1	1	10
Miami, Fla.	97	45	19	18	8	7	-
Norfolk, Va.	60	31	9	10	3	7	2
Richmond, Va.	85	49	20	12	1	3	3
Savannah, Ga.	53	36	9	6	2	-	5
St. Petersburg, Fla.	65	48	12	1	1	3	2
Tampa, Fla.	110	68	23	12	6	-	4
Washington, D.C.	125	67	30	20	5	3	1
Wilmington, Del.	38	27	5	5	-	1	-
E.S. CENTRAL	777	523	140	53	19	41	50
Birmingham, Ala.	120	75	25	7	3	10	3
Chattanooga, Tenn.	73	51	18	2	1	1	9
Knoxville, Tenn.	22	15	5	2	-	-	4
Louisville, Ky.	91	69	13	6	3	-	7
Memphis, Tenn.	164	110	21	15	3	14	12
Mobile, Ala.	105	72	21	8	3	1	4
Montgomery, Ala.	58	40	7	3	1	7	-
Nashville, Tenn.	144	91	30	10	5	8	11
W.S. CENTRAL	1,453	902	280	162	66	42	84
Austin, Tex.	61	36	11	10	4	-	4
Baton Rouge, La.	67	49	8	5	2	3	1
Corpus Christi, Tex.	44	34	6	2	1	1	5
Dallas, Tex.	208	129	40	25	8	6	4
El Paso, Tex.	58	35	14	6	2	1	3
Ft. Worth, Tex.	103	68	13	7	10	5	5
Houston, Tex.	363	205	79	54	13	12	37
Little Rock, Ark.	73	54	13	4	1	1	5
New Orleans, La.	130	84	18	20	5	2	-
San Antonio, Tex.	192	113	41	17	14	7	10
Shreveport, La.	51	32	12	5	1	1	6
Tulsa, Okla.	103	63	25	7	5	3	4
MOUNTAIN	712	468	117	75	30	21	32
Albuquerque, N.M.	98	64	17	11	4	2	2
Colo. Springs, Colo.	58	39	7	10	2	-	4
Denver, Colo.	113	73	26	9	1	4	7
Las Vegas, Nev.	116	71	19	15	6	4	1
Ogden, Utah	22	17	-	2	2	1	3
Phoenix, Ariz.	135	80	23	16	8	8	3
Pueblo, Colo.	25	17	6	2	-	-	1
Salt Lake City, Utah	37	20	6	6	4	1	3
Tucson, Ariz.	108	87	13	4	3	1	8
PACIFIC	1,939	1,254	357	221	46	52	87
Berkeley, Calif.	25	14	4	3	1	3	1
Fresno, Calif.	95	57	22	8	2	6	3
Glendale, Calif.	31	23	4	4	-	-	1
Honolulu, Hawaii	63	47	10	4	1	1	5
Long Beach, Calif.	63	37	15	6	2	3	5
Los Angeles, Calif.	538	343	100	65	18	4	13
Oakland, Calif.§	U	U	U	U	U	U	U
Pasadena, Calif.	30	24	3	2	-	1	2
Portland, Oreg.	155	103	32	15	2	3	5
Sacramento, Calif.	155	91	35	19	1	9	13
San Diego, Calif.	158	100	23	18	9	8	11
San Francisco, Calif.	172	99	31	36	2	3	4
San Jose, Calif.	155	115	22	15	1	2	14
Seattle, Wash.	153	99	22	21	3	8	1
Spokane, Wash.	54	35	17	1	1	-	1
Tacoma, Wash.	92	67	17	4	3	1	8
TOTAL	12,042††	7,625	2,282	1,328	422	370	637

*Mortality data in this table are voluntarily reported from 121 cities in the United States, most of which have populations of 100,000 or more. A death is reported by the place of its occurrence and by the week that the death certificate was filed. Fetal deaths are not included.

**Pneumonia and influenza.

†Because of changes in reporting methods in these 3 Pennsylvania cities, these numbers are partial counts for the current week. Complete counts will be available in 4 to 6 weeks.

††Total includes unknown ages.

§Report for this week is unavailable (U).

Maternal Risk Characteristics — Continued

(1626 [13.5%]), West Indian (1079 [8.9%]), Cape Verdean (574 [4.8%]), Hispanic (420 [3.5%]), and other ancestries (894 [7.4%]). Variables examined by MDPH included maternal age at delivery, maternal marital status, maternal education, and adequacy of prenatal care.*

Risk characteristics of black mothers varied by ethnic group. The percentage of births to teenagers (i.e., births to women aged ≤19 years) was highest for American mothers (21.7%), approximately eight times that for Haitians, 2.6 times that for West Indians, and 1.2–1.4 times that for Hispanics and Cape Verdeans (Table 1). Births to unmarried women were also most prevalent for American mothers (70.5%)—more than twice that for Haitians (32.4%) and 1.6 times that for West Indians (44.4%). However, the percentage of women with less than 8 years of education was highest for Cape Verdean (18.6%) and Haitian mothers (10.2%) and lowest for American mothers (1.3%).

The proportion of mothers who received adequate prenatal care varied less by ethnicity and was 62.0% in West Indian, 61.6% in other ancestry, 56.4% in Haitian, 54.6% in American, 53.8% in Hispanic, and 45.1% in Cape Verdean mothers. Mothers least likely to be foreign-born were American (3.0%) and the most likely, Haitian (99.2%) (Table 2). Within ethnic groups, maternal birth place was related to risk characteristics (Table 2). For all ethnic groups, mothers born on the U.S. mainland were more likely to be teenagers and unmarried. Conversely, for all ethnic groups, higher proportions of mothers who were not born on the U.S. mainland had less than 8 years of education.

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Editorial Note: Previous reports have described variations in maternal risk characteristics and infant outcomes among Hispanic mothers in relation to national

*Adequacy of prenatal care was defined through the Kessner Index; adequate care refers to women with nine or more prenatal care visits, with those visits beginning during the first trimester.

TABLE 1. Percentage of maternal risk characteristics for live-born infants of black mothers, by maternal ethnicity — Massachusetts, 1987 and 1988

Maternal characteristic	American (n=7473)	Haitian (n=1626)	West Indian (n=1079)	Cape Verdean (n=574)	Hispanic (n=420)	Other ancestry (n=894)
Age ≤19 yrs	21.7	2.8	8.5	15.2	17.4	14.5
Unmarried	70.5	32.4	44.4	51.7	60.0	43.5
Education ≤7 yrs	1.3	10.2	5.3	18.6	6.8	3.2
Adequate prenatal care*	54.6	56.4	62.0	45.1	53.8	61.6
Not born on U.S. mainland	3.0	99.2	88.2	60.3	67.7	54.2

*Adequacy of prenatal care was defined through the Kessner Index; adequate care refers to women with nine or more prenatal care visits, with those visits beginning during the first trimester.

TABLE 2. Percentage of maternal risk characteristics for live-born infants of black mothers, by maternal ethnicity and maternal place of birth — Massachusetts, 1987–1988

	American*		Haitian		West Indian*		Cape Verdean		Hispanic*		Other ancestry	
Maternal characteristic	Born on U.S. mainland (n=7246)	Not born on U.S. mainland (n=221)	Born on U.S. mainland (n=13)	Not born on U.S. mainland (n=1613)	Born on U.S. mainland (n=127)	Not born on U.S. mainland (n=950)	Born on U.S. mainland (n=228)	Not born on U.S. mainland (n=346)	Born on U.S. mainland (n=135)	Not born on U.S. mainland (n=283)	Born on U.S. mainland (n=409)	Not born on U.S. mainland (n=485)
Age ≤19 yrs	22.0	10.0	NA†	2.5	17.3	7.4	23.7	9.5	31.8	10.6	26.4	4.5
Unmarried	70.8	58.8	46.2	32.3	52.0	43.5	62.3	44.8	69.6	55.1	59.7	29.9
Education ≤7 yrs	1.2	3.2	NA†	10.2	NA†	5.9	0	31.6	NA†	9.1	1.2	4.8
Adequate prenatal care§	54.6	57.9	NA†	56.6	53.5	63.2	58.3	36.4	45.9	57.2	56.0	66.4

*Numbers vary from totals in Table 1 because not all mothers reported place of birth.
†Not available because cell size is less than four.
§Adequacy of prenatal care was defined through the Kessner Index; adequate care refers to women with nine or more prenatal care visits, with those visits beginning during the first trimester.

Maternal Risk Characteristics — Continued

ancestries (*4,5*) and maternal place of birth, as well as the association between levels of acculturation and health behaviors (*6–8*). These reports indicate that Hispanics are heterogeneous in terms of maternal risk characteristics, health behaviors, and infant outcomes and that these factors vary by ethnic group, place of birth, and acculturation.

In contrast to methods used to study Hispanics, classification schema and research efforts that focus on blacks have generally assumed ethnic homogeneity. However, the findings in this report indicate substantial ethnic heterogeneity among black mothers in Massachusetts and variations between ethnic heterogeneity and maternal risk characteristics. This report also documented that, within specific ethnic groups, the relation between maternal place of birth and risk characteristics varied. Finally, the MDPH findings suggest that current classification schema for assessing health status among blacks in the United States may be incomplete and that ethnic identification and national ancestry among blacks may be important variables affecting maternal risk characteristics. These findings are consistent with other reports indicating that health behaviors may vary by ethnicity: for example, foreign-born women have reported lower rates of smoking and other substance misuse during pregnancy than U.S.-born women (*3*). In addition, national data have demonstrated that outcomes are better for infants of foreign-born black mothers than for infants of U.S.-born black women: low birth weight is 36% lower, and infant mortality is 28% lower (*9*).

Neither race nor ethnicity has been adequately characterized for use in public health (*10*). Even though the use of race and ethnicity for self-reported data, such as birth certificates, may overlap, these variables have distinct implications for identifying maternal risk. Improved understanding of these terms should assist in clarifying the relation between maternal risk characteristics and infant outcome, as well as other public health problems.

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Epidemiologic Notes and Reports

Fish Botulism – Hawaii, 1990

On July 22, 1990, the Hawaii Department of Health (HDH) was notified that three adults from the same family had been hospitalized July 20–22 with clinical manifestations consistent with botulism. The first patient, a Hawaiian woman of Filipino origin, had onset on July 18 of double vision, difficulty swallowing and speaking, and muscle weakness. When admitted to the hospital on July 20, she had bilateral ptosis, extraocular movement dysfunction, absence of gag reflex, and prominent muscle weakness. During the next 3 days, she developed progressive respiratory impairment and respiratory acidosis. On July 21, her mother was hospitalized with similar manifestations but without respiratory difficulty. On July 22, the index patient's husband was hospitalized with transient ptosis, blurred vision, and dysphonia. All patients were treated with botulinal antitoxin on July 23 and survived. Serum specimens obtained from all three patients after initiation of antitoxin therapy were negative for botulinal toxin. However, stool cultures obtained from the index patient and her mother yielded type B *Clostridium botulinum*. A common meal of palani (surgeon fish) had been prepared and eaten at home on the evening of July 17. Samples of leftover fish were tested at CDC and contained type B *C. botulinum* toxin; culture of the samples yielded type B *C. botulinum*.

The palani, a reef scavenger fish eaten by local residents, had been purchased fresh and cleaned at a retail fish market on July 17, the day of the meal; the index patient's husband cooked the palani directly on the grill at home. After grilling the palani on both sides, he opened the fish with his fingers and noted remnants of the intestines inside the fish. Both the index patient and her mother ate the palani's intestines and the meat around it; the index patient's husband used his fingers to eat the meat near the head and tail, but avoided the intestines. A fourth family member present at the same meal ate meat from the back of the palani only and had no symptoms.

The palani had been sold to the market by local fishermen sometime during July 2–13; the length of time the palani had been held by the market could not be determined. An inspection of the market on August 7 found that fish were kept on ice in a display freezer case with nonfunctional cooling equipment; the internal temperature of the fish on top of the ice in the display freezer was 52 F (11 C). The HDH instructed the market to properly refrigerate the fish and recommended that fish be thoroughly cleaned and rinsed at the market when requested by customers; otherwise, customers should be clearly instructed to clean the fish thoroughly and dispose of all internal organs.

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Editorial Note: Foodborne botulism is caused by consumption of a neurotoxin produced by *C. botulinum*. Illness is characterized by cranial nerve dysfunction and descending muscle paralysis, which can progress to respiratory compromise. In the United States, most cases are associated with home-canned or preserved products. The diagnosis of botulism can be confirmed by detection of neurotoxin in serum

Fish Botulism — Continued

samples collected before antitoxin administration, by demonstration of neurotoxin in samples of stool or food, or by isolation of *C. botulinum* from a patient's stool. Because antitoxin may prevent progression of paralysis if administered shortly after onset of symptoms, clinicians should not wait for laboratory confirmation to consider antitoxin administration. Careful monitoring of respiratory function and intubation, if necessary, can be lifesaving. Testing of clinical or food specimens and acquisition of antitoxin can be arranged through state health departments.

The association between botulism and consumption of contaminated fish has been well established. From 1950 through 1989, 48 (13%) of 365 foodborne outbreaks of botulism in the United States were associated with consumption of fish (*1*; CDC, unpublished data). In all of these incidents, the fish had been processed and held before consumption. However, this report of fish-associated botulism from Hawaii is unusual because fresh (unpreserved and unfermented) fish was implicated as the source; this appears to be the first report in the United States of botulism caused by consumption of apparently fresh fish. This report is also unusual because most fish-associated cases of botulism are caused by type E *C. botulinum*; only three of the previous fish-associated outbreaks in the United States were caused by type B *C. botulinum* (*1*; CDC, unpublished data).

C. botulinum spores are common in marine sediments (*2*) and are frequently detected in fish intestines (*3*). Previous outbreaks of botulism in California, New York, and Israel were associated with consumption of kapchunka, an uneviscerated, freshwater fish soaked in brine and air-dried (*4–8*). In these outbreaks, salt concentrations, adequate to inhibit growth of *C. botulinum* in the flesh of the kapchunka, were considered to have been lower in the intestines, allowing *C. botulinum* organisms to produce toxin (*4*). In Hawaii, clinical manifestations were most severe in the two persons who ate fish intestines. Localization of toxin within the fish may be important because the consumption of fish intestines may be common in some ethnic groups.

Because refrigeration had been inadequate at the market, the internal temperature of the fish may have been elevated for lengthy periods. The conditions around the retained gut may have facilitated an anaerobic environment, allowing production of toxin. Although botulinal toxin is heat labile, cooking was insufficient to inactivate the toxin.

Because ethnic foods, such as kapchunka and possibly other ungutted fish, may continue to be rare sources of botulism in the United States, public health measures to prevent this problem must take into account local cultural practices. When botulism is suspected, state health departments should be contacted immediately, as rapid intervention may prevent additional cases and prompt administration of antitoxin may halt progression of symptoms.

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Quarterly Table Reporting Alcohol Involvement in Fatal Motor-Vehicle Crashes

The following table presents alcohol involvement in fatal motor-vehicle crashes in the United States for April–June 1990. This table, published quarterly in *MMWR*, underscores the tragic impact of alcohol use on highway safety. An accompanying article (page 397 of this issue) addresses different aspects of the epidemiology of alcohol-related traffic fatalities (ARTFs).

Estimated number and percentage of total traffic fatalities* and drivers involved in fatal crashes, by age and blood alcohol concentration (BAC) level — United States, April–June 1990

		Fatalities by BAC†					
		BAC=0.00		0.01%≤BAC≤0.09%		BAC ≥0.10%	
Age (yrs)	No. fatalities	No.	(%)	No.	(%)	No.	(%)
0–14	777	561	(72.2)	62	(8.0)	153	(19.8)
15–20	1,933	974	(50.4)	277	(14.3)	682	(35.3)
21–24	1,326	476	(35.9)	168	(12.6)	683	(51.5)
25–34	2,527	762	(30.2)	268	(10.6)	1,497	(59.2)
35–64	3,238	1,496	(46.2)	305	(9.4)	1,437	(44.4)
≥65	1,531	1,231	(80.4)	107	(7.0)	193	(12.6)
Total	**11,332**	**5,500**	**(48.5)**	**1,187**	**(10.5)**	**4,645**	**(41.0)**

		Drivers§ by BAC¶					
		BAC=0.00		0.01%≤BAC≤0.09%		BAC ≥0.10%	
Age (yrs)	No. drivers	No.	(%)	No.	(%)	No.	(%)
0–14**	49	42	(85.8)	3	(7.0)	4	(7.3)
15–20	2,391	1,605	(67.1)	284	(11.9)	501	(21.0)
21–24	1,829	989	(54.1)	192	(10.5)	648	(35.4)
25–34	4,042	2,290	(56.6)	351	(8.7)	1,402	(34.7)
35–64	5,002	3,595	(71.9)	282	(5.6)	1,125	(22.5)
≥65	1,382	1,245	(90.1)	55	(4.0)	82	(5.9)
Total	**14,695**	**9,766**	**(66.5)**	**1,167**	**(7.9)**	**3,762**	**(25.6)**

*Fatalities include all occupants and nonoccupants who died within 30 days of a motor vehicle crash on a public road.
†BAC distributions are estimates for drivers and nonoccupants involved in fatal crashes. Numbers of fatalities are rounded to the nearest whole number.
§Driver may or may not have been killed.
¶BAC distributions are estimates for drivers involved in fatal crashes. Numbers of drivers are rounded to the nearest whole number, and percentages may not add because of rounding.
**Although usually too young to legally drive, persons in this age group are included for completeness of the data set.
Source: Fatal Accident Reporting System, National Highway Traffic Safety Administration.

Quarterly Alcohol Table – Continued

A fatal crash is considered alcohol-related by the National Highway Traffic Safety Administration (NHTSA) if either a driver or nonoccupant (e.g., pedestrian) had a blood alcohol concentration (BAC) of ≥0.01 g/dL in a police-reported traffic crash. Persons with a BAC ≥0.10 g/dL (the legal level of intoxication in most states) are considered intoxicated. Because BAC levels are not available for all persons involved in fatal crashes, NHTSA estimates the number of ARTFs based on a discriminant analysis of information from all cases for which driver or nonoccupant BAC data are available. These data may reflect seasonal variations in the occurrence of ARTFs.

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